

Serial No. 10/648,265

Attorney Docket No. 20-016

REMARKS

Claims 1-3, 6-9, and 17-26 are pending. Claims 5 and 10-16 have been canceled. Claims 19-26 are new. The applicant respectfully requests reconsideration and allowance of this application in view of the above amendments and the following remarks.

Claims 1-4 were rejected under 35 USC 103(a) as being unpatentable over Karpinski '187 in view of Apollonov *et al.* The applicants respectfully request that this rejection be withdrawn for the following reasons.

Claim 1 now recites, among other things, that the laser diode bar is located between the coolant spaces and such that heat will be transferred in a direction parallel to the major surface from the first side of the laser diode bar to one of the coolant spaces and from the second side of the laser diode bar to the other of the coolant spaces. This amendment is supported at least by Figs. 3 and 4 of the original drawings. In the prior art combination of Karpinski and Apollonov *et al.*, every groove has a laser diode bar 9, and every groove also has a coolant space 17, beneath the laser bars, so that the direction of heat transfer is downward from the laser bars 9, perpendicular to the major surface. In the arrangement of the prior art combination, the laser diode bars are not located between coolant spaces, and the sides of the laser bars are not cooled. In the present invention, the sides of the laser bars are cooled, which permits operation at higher power as compared to the device of the prior art combination. Therefore, the rejection of claim 1 should be withdrawn.

Claims 2-4 depend on claim 1 and are considered to be patentable for the reasons given above with respect to claim 1. Therefore, the rejection of claims 2-4 should also be withdrawn.

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Claim 5 was rejected under 35 USC 103(a) as being unpatentable over Karpinski '187 in view of Apollonov *et al.* and Bennett *et al.* Claim 5 has been canceled and will not be discussed.

Claim 6 was rejected under 35 USC 103(a) as being unpatentable over Karpinski '187 in view of Apollonov *et al.* and Lang *et al.* Claim 6 depends on claim 1 and is therefore considered to be patentable for the reasons given above.

Claims 10-12, 17 and 18 were rejected under 35 USC 103(a) as being unpatentable over Bennett *et al.* in view of Apollonov *et al.* Claims 10-12 have been canceled and will not be discussed. As for claims 17 and 18, the applicants respectfully request that this rejection be withdrawn for the following reasons.

Claim 17 now recites, among other things, wherein the laser diode bar is located between the coolant spaces, such that heat will be transferred in a direction parallel to the first major surface from the laser diode bar to the coolant spaces and such that the coolant spaces are located in a direction that is perpendicular to the side walls of the grooves from any point on the sides of the laser diode bars. The features added to claim 17 are supported at least by Figs. 3 and 4.

Although the patent to Bennett *et al.* shows cooling grooves 62, 30, none of the cooling grooves of Bennett *et al.* is one of a plurality of substantially identical grooves that also include the heat-emitting groove, as claimed. Note that the cooling grooves of Bennett *et al.* are formed in the opposite surface of the substrate from the heat-emitting grooves.

Although the patent to Apollonov *et al.* shows substantially identical grooves, there is no suggestion or teaching in Apollonov *et al.* that cooling grooves could be arranged to cool the sides of the laser diode bars, as claimed.

A combination of Bennett *et al.* and Apollonov *et al.* would result in cooling grooves formed in an opposite side of the substrate from the heat-emitting grooves, which is unlike what

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is claimed. Such a combination would lack the formation of substantially identical grooves as claimed. Also, the device of the combination of Benett *et al.* and Apollonov *et al.* would lack uniform heat transfer from the diode bars. Thus the combination would not have been obvious to one skilled in the art.

The method of the present invention is much simpler than the method shown in the prior art combination, because substantially identical grooves are used for two purposes, which facilitates manufacture and lowers costs. In the prior art combination, the manufacture of the grooves would require forming grooves on two sides of a substrate instead of just one. Therefore, the applicants respectfully request that the rejection of claim 17 be withdrawn.

Claim 18 depends on claim 17 and is considered to be patentable for the reasons given above with respect to claim 17.

Claim 13 was rejected under 35 USC 103(a) as being unpatentable over Karpinski '187 in view of Benett *et al.* in view of Apollonov *et al.* and Lang *et al.* Claim 13 has been canceled and will not be discussed.

Claims 7-9 were said to be allowable if written in independent form. Claim 7 has essentially been written in its independent form. However, the wording of claim 7 has been changed slightly from its original form. Claim 7 was modified to clarify that the housing was part of the laser diode apparatus and not a separate apparatus. The substance of claim 7 has not been changed; therefore, claim 7 is considered to be in condition for allowance.

Claims 8 and 9 depend on claim 7 and are thus considered to be in condition for allowance.

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Claims 19-26 are new. Claims 19-26 depend on claim 1 and are therefore considered to be patentable based on claim 1. Claims 19-26 are supported at least by the originally filed drawings and involve no new matter.

In view of the foregoing, the applicant respectfully submits that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

Please charge any unforeseen fees that may be due to Deposit Account No. 50-1147.

Respectfully submitted,


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